model structure and for repeating said predicting and comparing steps to improve agreement in said comparing step.

Remarks

Claims 1-28 are pending in this application. The specification has been amended to correct minor errors. Claims 1, 23, 24, 27, and 28 have been amended. No new matter has been added to the application by virtue of the present amendment.

Information Disclosure Statement

The Examiner points out that the IDS fails to comply with 37 CFR 1.98(a)(2) since document AL (foreign patent 85/0567 WIPO) was not included. Applicant points out that this document was first filed in the US as application number 617,123 which issued as US Patent 4,593,368, and that this patent was also included with the IDS. The foreign counterpart was included in the IDS by mistake. Applicant wishes to remove the listing of the foreign counterpart from the IDS.

Rejections under 35 U.S.C. § 112, second paragraph

The Examiner rejects claims 19 and 21-26 under 35 U.S.C. § 112, second paragraph. In claim 19, applicant believes that the phrase, "a lens having a numerical aperture of less than about .1," is clear to one of ordinary skill in the art. Numerical aperture is a dimensionless number that characterizes the angle of light that a lens accepts (numerical aperture = n sin θ). Thus, a lens having a numerical aperture of less than about .1 accepts light through a small range of angles.

Claim 21 states, "wherein said range is equal to or less than about 5 degrees." Claim 21 depends on claim 20, "said diffracted light is measured at a fixed range of angles." Thus, the measuring is done at a fixed range of angles that is equal to or less than about 5 degrees. This is consistent with using a low numerical aperture lens.

Claim 23 has been amended to provide the antecedent basis needed in claim 24, and claim 24 has been amended to depend on claim 23.

Rejections under 35 U.S.C. § 102

The Examiner rejects claims 1-18 and 20-28 under 35 U.S.C. § 102 as being anticipated by McNeil et al. Applicant respectfully points out that nowhere does McNeil teach or suggest the following elements of claim 1:

(d) providing a model structure on a data processing machine, said model structure comprising a repeating structure on said substrate, said model structure comprising a model profile, wherein said model profile comprises an edge having more than one X position;

(e) mathematically predicting a predicted diffracted radiation intensity when said model structure is illuminated with said radiation; and

(f) comparing said predicted intensity with said measured intensity.

McNeil calculates the pitch based on an accurate knowledge of the angle of incidence of the laser beam and the angular location of each diffracted order (column 8, lines 41-43). McNeil calculates the line width from the measurement of the zero order transmitted power (column 8, lines 55-57). Thus, **McNeil directly calculates the pitch and line width from the measured angles and power**.

Furthermore, McNeil does not provide a model structure comprising a model profile, wherein said model profile comprises an edge having more than one X position, and then mathematically predicting diffracted radiation intensity when the model structure is illuminated with radiation, and then comparing the predicted intensity with measured intensity, as provided in claim 1.

First, McNeil's model sidewalls are perfectly vertical. There is not a model profile comprising an edge having more than one X position. McNeil's vertical edged model only has one X position. Thus, McNeil does not use a model line profile as provided in claim 1, as amended. In the present invention, as described in claim 1, there is a model line profile that not just a single vertical edge.

Second, McNeil merely compares the results of two theoretical models, one exact for an idealized structure of chrome oxide over chrome with perfectly vertical edges, and the other a simplification involving an infinitely thin sheet of chrome that is infinitely conducting. Thus, the rejection of claim 1 and claims dependent thereon under 35 U.S.C. § 102 has been traversed.

In addition, McNeil does not teach or suggest the iterative process described in claim 2 where the model line profile is adjusted and then the mathematical predicting step is done again to see if the agreement between predicted and measurement is improved. Nor does McNeil teach or suggest the determination of a line edge profile as described in claim 4. Nor does McNeil teach or suggest using a wide wavelength range as described in claims 13 and 14.

Similar reasoning applies to claims 27 and 28, as amended as to claim 1, as amended. Thus, the rejection of claims 1-28 under 35 U.S.C. § 102 has been traversed.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejects claim 19 under 35 U.S.C. § 103 as being unpatentable over McNeil et al. The Examiner acknowledges that McNeil lacks the teaching of illuminating with a lens. As indicated above McNeil does not teach other important elements of independent claim 1. The lack of teaching for claim 19 adds to the omitted teaching. In view of the fact that there is no teaching or suggestion of elements d, e, and f in claim 1 and in all claims dependent thereon, applicant believes that claim 19 is not obvious in view of McNeil. Thus, the rejection under 35 U.S.C. § 103 has been traversed.

Reconsideration of the application, as amended, is requested. In order to facilitate prompt resolution, and early issuance of a patent, applicant requests that the Examiner call applicant's attorney if there are any remaining concerns or issues.

Respectfully submitted,

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